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United States
Department of
Agriculture

Soil
Conservation
Service

Montana
Agricultural
Experiment
Station

Bozeman,
Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow Forecasts as of May 1, 1984

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
Federal Bldg., Rm. 443
10 East Babcock
Bozeman, MT 59715

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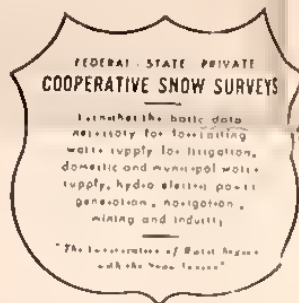


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The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, Room 443, Federal Building, 10 East Babcock, Bozeman, Montana.



Statewide stream-flow forecasts vary

Below average to well below average runoff is forecast for the northwestern one-third of the state and most of the Yellowstone River drainage above the Bighorn.

Missouri River headwater streams and streams draining the front face of the Beartooth Range are expected to have average to above average streamflow during the spring and summer months. Shortages of irrigation water supplies can be expected in many areas.

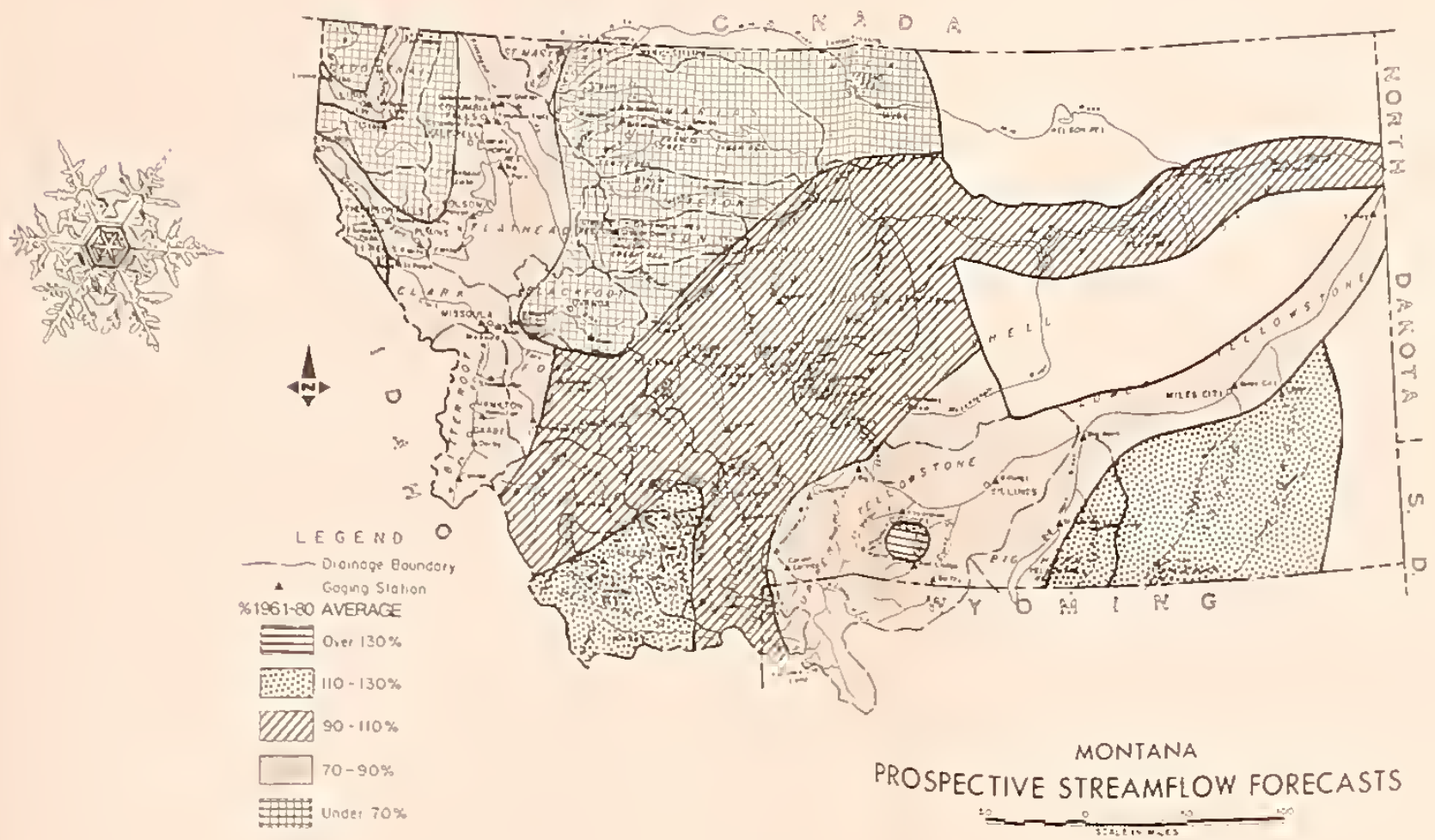
Snowpack improves in some areas

Heavy snowfall near the end of April, centered around Red Lodge in south-central Montana, dropped an estimated 7 feet of snow in 5 days and improved snowpacks in this area.

Through April, southern drainages continued to pick up snow while the northern areas ended up short again.

Snowpacks in southwest, central and south-central Montana have average or above average levels of water stored in the snowpack. All other have below to well below average.

High elevation snowpacks continue to build through April while lower elevations are generally showing melt.



MONTANA
PROSPECTIVE STREAMFLOW FORECASTS

Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN, STREAM and FORECAST POINT	THIS YEAR				LAST YEAR			
	FORECAST		HISTORICAL		FORECAST		HISTORICAL	
	Flow	Range	Flow	Range	Flow	Range	Flow	Range
PERIOD	May - September				May - July			
RED ROCK RIVER near Monida (1)	93.1	115	157	80.7	85.0	116	130	73.5
BEAVERHEAD RIVER near Grant (2)	150	125	206	120	126	127	154	99.0
BEAVERHEAD RIVER at Barratt (2)	198	122		162	165	123		134
RUBY RIVER near Alder	106	116		91.6	88.0	117		74.9
RIG HOLE RIVER near Melrose	620	92		674	560	91		614
BOULDER RIVER near Boulder	20.4	117		17.5	18.0	118		15.3
WILLOW CREEK near Harrison	402	91	479	440	300	90	355	332
MADISON RIVER near Grayling (3)	775	104	864	743	590	104	665	568
MADISON RIVER near McAllister (4)	520	101	509	514	442	102	426	433
GALLATIN RIVER near Gateway	27.9	109	25.1	25.6	24.4	108	21.3	22.6
INFLUX MIDDLE CREEK RESERVOIR near Bozeman (5)	45.5	108		42.0	38.8	108		35.9
HYALITE CREEK near Bozeman (6)	555	103		541	462	102		452
GALLATIN RIVER at Logan	2250	102	2849	2,200	1900	103	2049	1,849
MISSOURI RIVER at Toston (7)	18.4	91	15.5	20.2	15.7	90	11.8	17.4
SHEEP CREEK near White Sulphur Springs	325	60	329	538	285	58	284	489
SUN RIVER at Gibson Dam (8)	118	94		126	105	92		114
BELT CREEK near Monarch	3370	98		3,440	2870	98		2,928
MISSOURI RIVER at Fort Benton (9)	150	68		222	140	67		210
TWO MEDICINE CREEK near Browning (10)	83.0	69		120	69.0	67		103
RADDER CREEK near Browning	55.8	70	47.7	79.7	46.0	68	38.0	67.7
INFLUX SWIFT RESERVOIR near Dupuyer	70.0	67		104	64.0	65		98.0
CITY BANK CREEK at Cut Bank	295	62	215	473	270	60	200	449
MARIAS RIVER near Shelby	3722	94		3,960	3210	94		3,418
MISSOURI RIVER at Virgilio (11)	4052	94		4,303	3485	94		3,707
MISSOURI RIVER near Landusky (11)	4.8	91		5.3	3.8	88		4.3
NORTH FORK MISSISSHELL RIVER near Hartlandale	48.6	86		56.5	45.0	85		52.7
SOUTH FORK MISSISSHELL RIVER above Hartlandale	4052	95		4,244	3520	95		3,711
MISSOURI RIVER below Fort Peck Dam (11)	177	84		199				
MILK RIVER at Eastern Crossing	21.5	39		55.4				
MILK RIVER at Eastern Crossing (12)	9660	89		10,855	8650	89		9,708
INFLUX LAKE SAKAKAWA, ND (11)								
SASKATCHEWAN RIVER BASIN	89.5	74	93.6	121	75.0	72	81.2	104
SWITCHPOUR CREEK at Sherburne (14)	340	73		465	285	72		394
ST. MARY'S RIVER near Hobb (13)								

STREAMFLOW MEASUREMENTS DISCONTINUED

- (1) Adjusted for storage in Lima Reservoir.
- (2) Adjusted for storage in Lima and Clark Canyon Reservoirs.
- (3) Adjusted for storage in Hebgen Lake.
- (4) Adjusted for storage in Hebgen Lake and Ennis Lake.
- (5) Sum of West Fork Hyalite Creek and East Fork Hyalite Creek above the Reservoir.
- (6) Adjusted for storage in Middle Creek Reservoir.
- (7) Adjusted for storage in Lima, Hebgen, Ennis & Clark Canyon Reservoirs.
- (8) Adjusted for storage in Gibson Reservoir & diversions.
- (9) Adjusted for storage in Lima, Clark Canyon, Hebgen, Ennis, Gibson, Plakhan, Willow Creek & Canyon Ferry Reservoirs.
- (10) Adjusted for storage in Two Medicine Reservoir & diversions in Two Medicine Canal.
- (11) Adjusted for all upstream reservoirs.
- (12) Flow at Eastern Crossing minus St. Mary's Canal.
- (13) Adjusted for storage in Lake Sherburne.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and FORECAST POINT	THIS YEAR				LAST YEAR			
	FORECAST		HISTORICAL		FORECAST		HISTORICAL	
	Flow	Range	Flow	Range	Flow	Range	Flow	Range
PERIOD	May - September				May - July			
YELLOWSTONE RIVER at Corwin Springs	1575	81	1656	1,944	1280	80	1328	1,602
YELLOWSTONE RIVER near Livingston	1820	80		2,269	1480	80		1,860
BOULDER RIVER at Big Timber	285	74		385	255	72		353
STILLWATER near Absarokee (1)	545	90		606	460	92		502
CLARK'S FORK RIVER near Belfry	480	79		600	420	78		541
ROCK CREEK near Red Lodge	69.0	134		51.5	56.0	138		40.5
INFLUX COONEY RESERVOIR near Boyd (2)	3422	81	3582	4,255	2930	82	2923	3,571
YELLOWSTONE RIVER at Billings	1442	79	1927	1,833	1320	80	1716	1,651
BIGHORN RIVER near St. Xavier (3)	180	115		157	158	115		137
LITTLE BIGHORN RIVER near Hardin	280	115		244	250	115		218
TONGUE RIVER near Decker	5037	80		6,273	4350	81		5,391
YELLOWSTONE RIVER at Miles City (4)	327	118		233	300	119		212
POWDER RIVER at Moorhead	5661	82		6,921	4920	83		5,947
YELLOWSTONE RIVER near Sidney (5)								

STREAMFLOW MEASUREMENTS DISCONTINUED BY USGS

- (1) Adjusted for storage in Mystic Lake.
- (2) Adjusted for storage in Cooney Reservoir.
- (3) Adjusted for storage in Buffalo Bill, Boyesen, Bull Lake, Pilot Butte and Bighorn Reservoirs.
- (4) Adjusted for storage in Bull Lake, Buffalo Bill, Boyesen, Pilot Butte, Bighorn and Tongue River Reservoirs.
- (5) Adjusted for reservoirs shown in (4) and diversions into the Lower Yellowstone Canal.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

Runoff variable in Yellowstone drainage

Red Lodge Creek, Willow Creek and other streams draining the front face of the Beartooth are expected to produce above average runoff from the heavy snows recently deposited on top of earlier season accumulations.

Some late season irrigation water shortages can be expected on most streams in the area above the Bighorn River.

Current weather conditions and the amount of snowpack on snow pillows indicate the Yellowstone River and most of its tributaries will reach their peak snowmelt runoff around mid-June at levels near to a little below average.

The Yellowstone, Boulder, Stillwater and Clark's Fork Rivers are still forecast to have spring and summer runoff 10 to 20 percent less than average. Streams flowing out of the Crazy, Pryor and Bighorn Mountains should have average to a little above average runoff.

PEAK FLOWS

(MAXIMUM MEAN DAILY) (AVERAGE for 24 hrs. on day of greatest flow)

FORECAST POINT	PEAK FLOW (SECOND FEET)	
	Forecast Range	Average
Yellowstone River at Corwin Springs	13,000 - 16,000	18,790
Yellowstone River at Livingston	16,000 - 19,000	21,140
Boulder River near Big Timber	3,700 - 4,500	5,332
Stillwater River near Absarokee	5,000 - 7,000	6,644
Clark's Fork River near Belfry	5,500 - 7,000	7,611
Yellowstone River at Billings	35,000 - 45,000	43,365

*Highly abnormal weather during the critical melting period may cause the peak to be outside the indicated range.

Average based on 1961-80 period.

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" with respect to local supply.

STREAM or AREA	Flow Forecast	
	Spring Season	Late Season
Beaverhead	Exc	Avg
Ruby	Exc	Avg
Big Hole	Fair	Fair
Boulder	Fair	Fair
Jefferson	Avg	Fair
Madison	Avg	Avg
Gallatin	Avg	Avg
West-Side Missouri	Avg	Avg
Smith-Belt	Avg	Fair
Sun	Poor	Poor
Teton	Poor	Poor
Marias	Poor	Poor
Judith	Fair	Fair
Musselshell	Fair	Fair
Milk	Poor	Poor
Bear Paws	Fair	Fair
St. Mary's	Fair	Poor

Some streams near average

The headwaters of the Missouri River should have near to above average spring and summer runoff. Streams draining in the central mountain ranges are forecast to have a little below average runoff. Well below average runoff is expected from streams originating along the Continental Divide north of Stemple Pass, west of Helena.

Irrigation water will be in short supply on all streams in the Sun, Teton, Marias and Milk River drainages where stored water is not available. Other areas should have near average supplies.

Based on snow pillow records and current conditions, the Big Hole River is expected to reach its peak snowmelt runoff in early June with a little below average peak flow. The peak inflow to Hebgen Lake on the Madison is expected near the end of May or early June at a little less than average amount. The Gallatin River is forecast to peak a little higher than average around mid-June.

These headwater streams will all combine for a near average to slightly above average peak inflow to Canyon Ferry Reservoir the first or second week in June.

Missouri snowpack near average

The southwestern part of the Missouri drainage continues to receive good mountain snowfall. Accumulated snowpack in the headwaters area is generally average or above average.

Some slight improvement has been noted in the Sun, Marias, Teton and Dearborn headwaters but the water stored in the snowpack is still only about one-half of average levels. Small mountain ranges in the central part of the state continue to show near average snowpacks.

The major storm of April 24-28 that seemed to be centered in the Red Lodge area did deposit considerable snow in the Tobacco Root and Bridger Ranges and the north end of the Gallatin Range south of Bozeman. These areas received 2 to 3 feet of new snow during the storm. The area along the Continental Divide between Butte and Helena also received considerable snow during April.

Snowpacks are still accumulating at most of the higher elevations. Some melt did occur around mid-April but was replaced with new snowfall. Snowpacks in lower elevations have melted or are melting slowly.

SUMMARY OF SNOW MEASUREMENTS

RIVER BASIN SUBWATERSHED	Number of Gauging Stations	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average
Beaverhead	28	100	112
Ruby	13	110	121
Big Hole	27	100	99
Boulder	11	117	106
Jefferson	79	103	108
Madison	33	97	100
Gallatin	23	111	99
Missouri Headwater	135	103	104
West-Side Missouri			
(Toston-Cascade)	11	114	92
Smith-Belt-Arrow	11	114	90
Missouri Main-stem	22	114	91
Teton & Sun	12	78	46
Marias	5	98	65
Marias-Teton-Sun	17	88	55
Judith-Musselshell	17	156	102
Milk	10	58	42
Bear Paws	7	0	0
Missouri (Total)	191	106	98

Saskatchewan			
St. Mary's	10	74	57
Bow River in Alberta	4	70	67

SUMMARY OF SNOW MEASUREMENTS

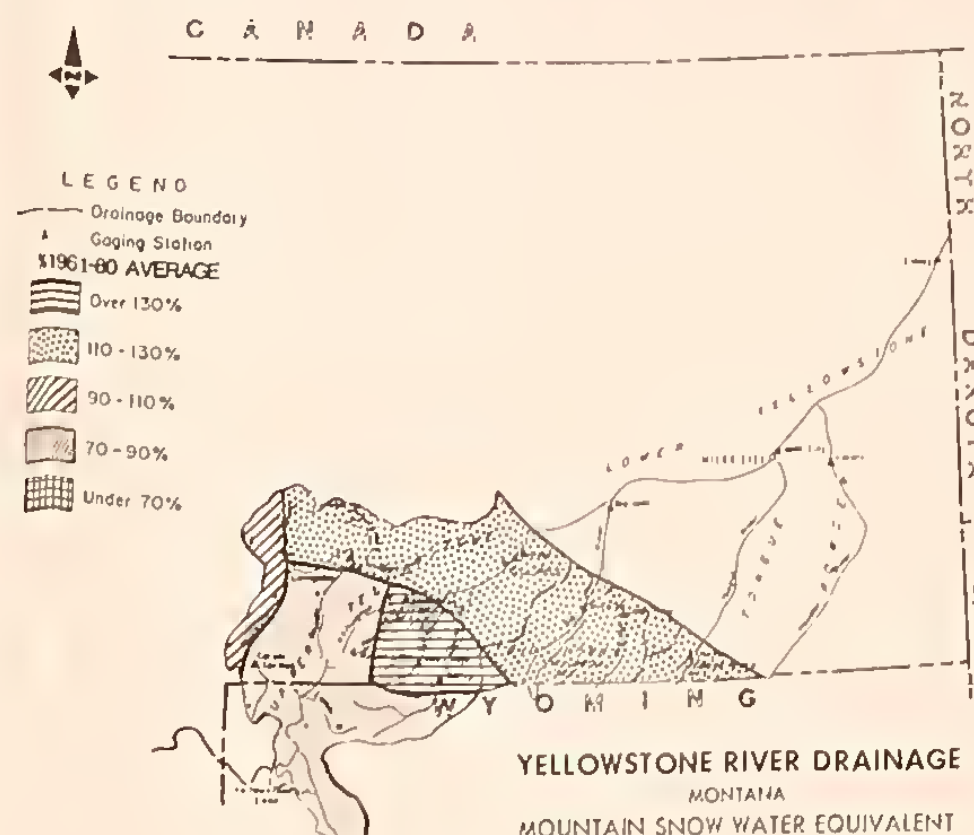
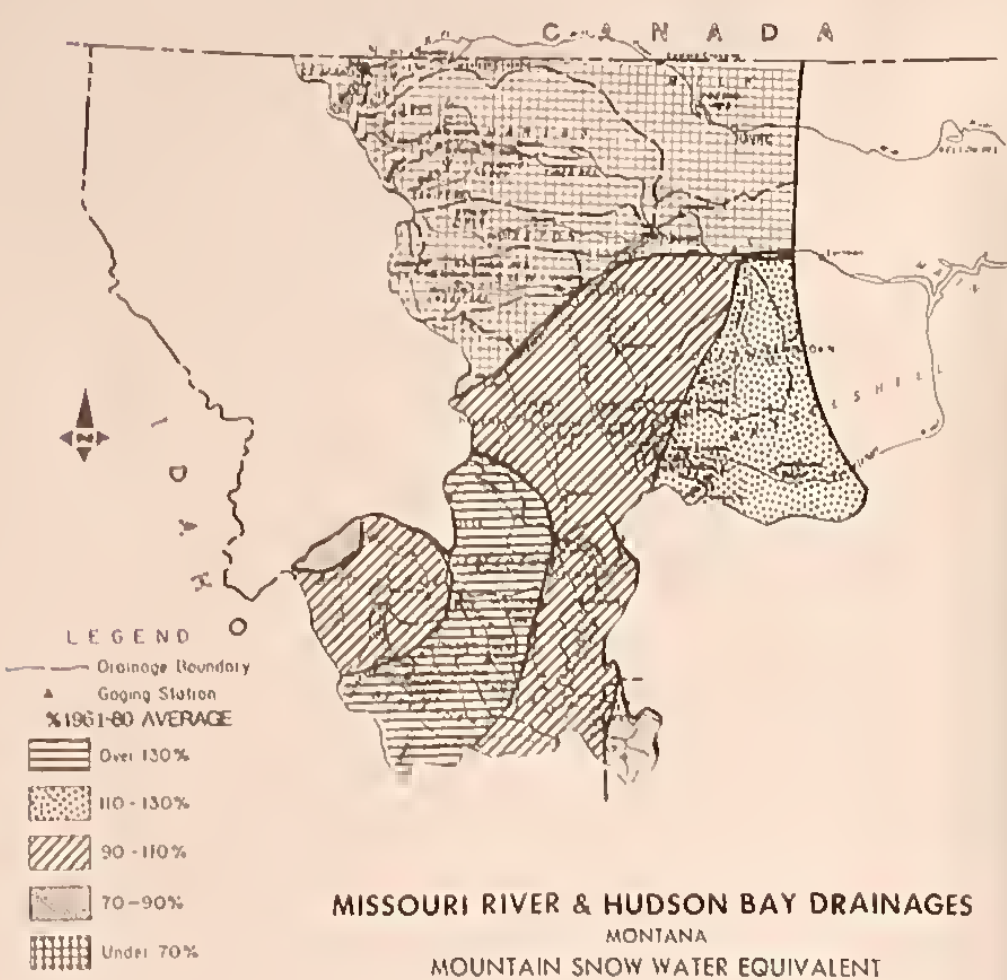
(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN SUBWATERSHED	Number of Gauging Stations	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average
Upper Yellowstone	18	101	80
ab Livingston	10	139	104
Shields			
Boulder	9	102	81
Stillwater			
Rock Creek & Clark's Fork	17	106	95
Yellowstone (a)	54	109	89
Bighorn River	29	108	100
Bighorn/Wyomin	1	142	116
Little Bighorn	30	110	101
Bighorn (Total)	2	126	103
Tongue	3	155	102
Powder			
Yellowstone (Total)	89	111	93

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" with respect to local supply.

STREAM or AREA	Flow Forecast	
	Spring Season	Late Season
Yellowstone at Livingston	Fair	Poor
Shields	Avg	Avg
Boulder	Fair	Poor
Stillwater	Avg	Avg
Rock Creek	Avg	Fair
Clark's Fork	Fair	Poor
Yellowstone above Bighorn	Fair	Fair
Bighorn	Avg	Avg
Little Bighorn	Avg	Fair
Tongue	Avg	Fair
Powder	Avg	Fair
Lower Yellowstone	Fair	Fair



SNOW SURVEY DATA

May 1, 1984						
SNOW	THIS YEAR					
	DATE	SNOW DEPTH	WATER CONTENT	WATER CONTENT	WATER CONTENT	WATER CONTENT
NAME	Elevation	At Survey	(Inches)	(Inches)	Last Year	Average
ABUNDANCE LAKE	8800	4/29	66	22.5	23.9	24.4
AMBROSE	6480	4/24	42	15.0	10.4	13.7
ARCH FALLS	7350	4/28	56	15.4	11.7	15.7
ASHLEY DIVIDE	4820	4/27	0	.0		2.9
ASHLEY LAKE	4090	4/27	0	.0		3.0
BADGER PASS	6900	4/28	82	29.8	29.2	44.2
BADGER PASS PILLOW	6900	5/01	SP	26.5	26.4	38.0
BALD EAGLE PEAK	5700	4/25	100	43.7	58.9	63.6
BALD RIDGE	7500	5/01	45	16.0	9.4	13.9
BANFIELD MOUNTAIN	5600	4/25	24	8.3	23.8	23.9
BANFIELD MOUNTAIN PILLOW	5600	5/01	SP	9.0	20.7	17.5
BARRE CREEK	5500	4/26	67	29.3	43.7	47.5
BARRE MIDWAY	4600	4/26	37	14.6	28.9	33.2
BARRE TRAIL	3800	4/26	0	.0		1.6
BARRE LAKES PILLOW	8250	5/01	SP	18.1	19.6	17.1
BASIN CREEK	7180	4/26	43	12.0	11.3	9.8
BASIN CREEK PILLOW	7180	5/01	SP	12.2	11.0	9.6
BASSOOR PEAK	5150	5/01	0	.0		6.9
BEAGLE SPRINGS	8850	4/28	44	13.2	11.5	8.0
BEAGLE SPRINGS PILLOW	8850	5/01	SP	13.0	9.7	8.3
BEAR BASIN	8150	4/30	71	25.4	21.5	24.2
BEAR PAW SKI AREA	5200	4/30	0	.0		2.6
BEAVER LAKE	5900	4/28	43	13.8	14.3	26.0
BIG CREEK	6750	4/28	102	43.2	49.8	52.0
BIG SKY	7700	4/30	54	18.4	16.4	18.1
BIG SKY MEADOW	6350	4/30	14	5.2	6.6	4.6
BIG SNOWY	7150	4/25	70	29.2	14.9	26.4
BLACK BEAR	7950	5/01	98	40.4	48.5	44.8
BLACK BEAR PILLOW	7950	5/01	SP	36.9	39.2	38.8
BLACK MOUNTAIN	7250	5/01	66	22.6	17.9	17.4
BLACK PINE	7100	4/25	33	10.4	10.2	14.9
BLACK PINE PILLOW	7100	5/01	SP	13.3	10.8	15.6
BLOODY DICK	7600	4/26	45	13.0	13.4	14.1
BLOODY DICK PILLOW	7550	5/01	SP	12.8	12.2	9.1
BLUE LAKE	5900	4/28	45	16.0	17.0	25.3
BOIS SOTS	7750	5/01	58	14.6	10.2	10.2
BOULDER MOUNTAIN	7950	4/25	65	23.6	21.2	22.9
BOULDER MOUNTAIN PILLOW	7950	5/01	SP	24.2	24.0	23.2
BOX CANYON	6670	4/29	25	6.6	6.2	8.3
BOX CANYON PILLOW	6700	5/01	SP	4.0	4.4	6.0
BOXFLDER CREEK	5100	4/30	0	.0		1.8
BRANIAN LAKES	8850	4/30	116	42.6	38.5	35.7
BRIDGER BOWL	7250	4/30	75	30.4	24.0	32.6
BRIDGER BOWL PILLOW	7250	4/30	SP	30.0	23.6	30.3
BRISLOW CREEK	3900	4/25	0	.0		1.7
BRUSH CREEK IIMFER	5000	4/27	4	1.5	6.6	7.7
BULL MOUNTAIN	6600	5/03	17	5.3	3.2	3.7
CARIN CREEK	5200	4/26	3	.3	.4	2.3
CALL ROAD	8050	4/28	52	16.2	14.2	14.2
CALVERT CREEK	6430	4/25	23	7.6	10.0	10.1
CALVERT CREEK PILLOW	6430	5/01	SP	1.7	5.2	2.8

May 1, 1984						
SNOW	THIS YEAR					
	DATE	SNOW DEPTH	WATER CONTENT	WATER CONTENT	WATER CONTENT	WATER CONTENT
NAME	Elevation	At Survey	(Inches)	(Inches)	Last Year	Average
CAMP MISERY	6400	4/24	127	58.0	55.2	53.7
CAMP SENIA	7890	5/01	51	12.7	8.6	10.0
CARROT BASIN	9000	4/30	109	39.3	42.4	43.3
CARROT BASIN PILLOW	9000	5/01	SP	33.1	38.9	33.0
CASH CREEK PILLOW	7800	5/01	SP	11.2	10.0	9.5
CIDAR GROVE	3760	4/25	0	.0		7.1
CHESSMAN RESERVOIR	6200	4/27	17	3.4	2.3	2.8
CHICKEN CREEK	4060	4/26	0	.0		1.4
CLOVER MEADOW	8600	4/28	74	21.0	20.8	21.0
CLOVER MEADOW PILLOW	8600	5/01	SP	24.9	13.6	18.2
COLT CREEK	7850	5/02	99	28.4	24.4	24.2
COLT CREEK PILLOW	7850	5/01	SP	28.2	23.1	19.0
COLLEY CREEK	6300	4/28	12	3.3	.0	4.6
COMBINATION	5600	4/25	7	2.3	1.0	3.6
COMBINATION PILLOW	5600	5/01	SP	.7	.7	2.6
COOKI STATION	8150	4/26	51	16.6	18.8	22.2
COPPER BOTTOM	5200	4/29	9	2.0	.0	5.8
COPPER BOTTOM PILLOW	5200	5/01	SP	5.2	2.2	7.1
COPPER CAMP	6950	4/29	52	19.5	21.8	32.4
COPPER CAMP PILLOW	6950	5/01	SP	21.2	25.4	35.9
COPPER CREEK	5700	4/29	16	3.6	5.0	10.9
COPPER LAKE CREEK	6100	4/29	37	12.2	16.8	24.2
COPPER MOUNTAIN	7700	5/04	39	13.6	11.0	11.8
COTTONWOOD CREEK	6400	4/27	40	11.0	9.2	8.3
COYOTE HILL	4200	4/26	0	.0		3.6
CRYSTAL LAKE	6050	4/25	39	15.4	6.2	13.5
CRYSTAL LAKE PILLOW	6050	5/01	SP	15.9	6.0	12.4
DAD CREEK LAKE	8400	4/28	87	19.8	16.2	17.4
DAISY PEAK	7600	4/30	36	8.4	8.4	10.9
DALY CREEK	5800	4/30	32	11.4	10.4	12.8
DALY CREEK PILLOW	5780	5/01	SP	7.3	4.1	8.8
DARKHORSE LAKE	8600	4/28	83	33.4	26.6	30.4
DARKHORSE LAKE PILLOW	8700	5/01	SP	28.6	21.5	30.3
DAVIS CREEK	5400	4/25	33	12.3	24.7	24.0
DEADMAN CREEK	6450	4/26	20	6.6	6.7	9.5
DEADMAN CREEK PILLOW	6450	5/01	SP	6.6	5.6	7.4
DESERT MOUNTAIN	5600	4/24	26	10.2	13.1	14.6
DEVILS SLIDE	8100	4/28	92	28.8	23.4	28.0
DISCOVERY BASIN	7050	4/25	44	13.0	8.8	10.6
DIVIDE	7800	4/28	41	13.4	14.0	11.7
DIVIDE PILLOW	7800	5/01	SP	15.1	14.3	12.2
DIX HILL	6400	4/30	22	8.4	.0	5.4
DUPUYER CREEK PILLOW	5750	5/01	SP	4.7	-	-
EAST BOULDER S	9250	4/28	81	28.0A	29.0	35.0
EAST FORK R.S.	5400	4/26	0	.0		0.7
ELK HORN SPRINGS	7800	4/28	28	9.0	8.4	9.1
ELK PEAK	8000	4/30	55	19.0	15.4	20.8
EMERY CREEK	4500	4/24	18	7.2	10.6	8.4
EMERY CREEK PILLOW	4500	5/01	SP	6.1	12.8	6.9
FATLY CREEK	5500	4/28	52	20.4	21.8	25.2
FISH CREEK	9000	4/26	54	13.9	15.1	12.6
FISHER CREEK	8100	4/26	92	34.4	34.8	44.5
FISHER CREEK PILLOW	9100	5/01	SP	31.4	30.8	40.7
FIVE-RILL	5700	4/29	3	.3	.0	4.5
FLATTOP MOUNTAIN PILLOW	6300	5/01	SP	32.9	42.2	52.8
FLEECER RIDGE	7500	5/03	28	9.0	9.9	9.9
FOULHFN	8280	4/29	50	16.4	19.2	20.0
FOUR MILE	6900	5/01	44	12.6	9.1	8.1
FOURTH OF JULY	3450	4/25	0	.0		3.2
FRED NARR PASS	8000	5/04	86	31.4	25.2	29.8
FREIGHT CREEK	6000	4/28	30	8.5	9.7	15.0

May 1, 1984						
SNOW	THIS YEAR					
	DATE	SNOW DEPTH	WATER CONTENT	WATER CONTENT	WATER CONTENT	WATER CONTENT
NAME	Elevation	At Survey	(Inches)	(Inches)	Last Year	Average
FOJDAY HILL	4670	4/25	20	6.7	17.8	11.1
FOJMYER MEADOWS	6480	4/27	32	7.6	5.4	6.5
FOJMYER MEADOWS PILLOW	6480	5/01	SP	9.1	8.0	7.6
GARVER CREEK	4250	4/25	0	.0		5.2
GARVER CREEK PILLOW	4250	5/01	SP	.0		4.3
GIBBONS PASS	7100	4/26	65	24.7	25.0	24.0
GOAT MOUNTAIN	7000	4/27	10	2.4	4.4	10.3
GOLD STONE	8100	4/26	58	17.6	18.4	19.6
GPASSHOPPER	7000	4/30	13	5.1	4.0	5.6
GRAVE CREEK	4300	4/25	14	5.3	14.1	15.1
GRAVE CREEK PILLOW	4300	5/01	SP	3.2	11.8	8.1
GRIFFIN CREEK DIVIDE	5150	5/01	9	3.5	6.1	7.9
GUNSLIGHT LAKE	6300	4/28	77	32.4	33.0	43.9
HAND CREEK	5030	4/30	21	6.8	11.0	9.4
HAND CREEK PILLOW	5030	5/01	SP	7.0	10.2	9.3
HAWKINS LAKE	6450	4/25	54	20.6	34.1	35.4
HAWKINS LAKE PILLOW	6450	5/01	SP	19.0	31.4	33.1
HEART LAKE TRAIL	4800	4/29	27	11.3	9.0	18.4
HEBGEN DAM	6550	4/30	33	10.8	12.2	7.6
HELL ROARING DIVIDE	5770	5/01	59	24.9	29.6	32.4
HERRIG JUNCTION	4850	4/26	38	14.7	25.3	22.3
HOLBROOK	4530	4/24	0	.0		2.2
HOOD MEADOW	6600	4/28	43	11.6	7.8	12.3
HOODOO BASIN	6050	4/29	98	42.8	45.7	54.5
HOODOO BASIN PILLOW	6050	5/01	SP	36.7	40.5	47.8
HOODOO CREEK	5900	4/29	89	39.4	41.4	50.7
JCEHEPG LAKE #3	5600	4/25	44	16.6	21.1	32.9
INDEPENDENCE	7850	4/29	46	13.4	13.8	19.3
INTERGAARD	6450	4/30	29	9.4	5.2	8.4
JAHNKE LAKE TRAIL	7200	4/26	32	8.6	9.6	9.2
JOHNSON PARK	6450	4/30	4	.9	0.0	3.1
JOSEPHINE LOWER #9	4900	4/26	25	7.7	10.9	17.7
KEELER CREEK	3300	4/25	0	.0		1.5
KINGS HILL	7500	4/26	46	15.0	9.6	16.7
KIWANIS CAMP	3720	4/30	0	.0		0.5
KRAFT CREEK PILLOW	4750	5/01	SP	1.2	.6	7.4
LAKE CREEK	6100	4/28	21	6.4	5.7	3.8
LAKEVIEW CANYON	6930	4/26	34	9.6	19.4	12.6
LAKEVIEW RIDGE	7400	4/26	31	9.2	17.3	10.5
LAKEVIEW RIDGE PILLOW	7400	5/01	SP	12.8	19.9	8.9
LEMHI PASS	7480	4/28	40	13.2	5.0	7.4
LEMHI RIDGE	8100	4/28	47	15.5	8.6	10.6
LEMHI RIDGE PILLOW	8100	5/01	SP	15.5	9.6	10.6
LICK CREEK	6860	4/27	60	12.6	9.4	10.8
LICK CREEK PILLOW	6860	5/01	SP	12.4	8.4	8.3
LITTLE PARK	7400	4/30	55	18.6	15.8	18.4
LOGAN CREEK	4300	4/27	0	.0		2.7
LONG MOUNTAIN	8880	4/30	72	29.0	26.1	27.0
LOST HORSE	5940	4/27	72	29.6	26.8	34.9
LOST SOUL	4800	4/25	0	.0		10.7
LOWER TWIN	7900	5/01	94	30.6	27.6	25.6
LOWER TWIN PILLOW	7900	5/01	SP	27.7	26.2	23.8
LUBRECHT FLUME	4680	5/01	0	.0		0.2
LUBRECHT FLUME PILLOW	4680	5/01	SP	.0		0.6

SNOW	May 1, 1984			THIS YEAR			PAST RECORD	
	DRAINAGE BASIN and/or SNOW COURSE			Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
	NAME	E	Elevation				Last Year	Average
LUBRECHT FOREST # 3			5450	5/01	3	1.0	.0	3.9
LUBRECHT FOREST # 4			4650	5/01	0	.0	.0	0.3
LUBRECHT FOREST # 6			4040	5/01	0	.0	.0	0.1
LUBRECHT HYDRO PLOT			4200	5/01	0	.0	.0	0.8
MADISON PLATEAU			7750	5/01	58	21.8	27.2	23.6
MADISON PLATEAU PILLOW			7750	5/01	SP	19.0	26.2	24.3
MANY GLACIER			4900	4/28	23	8.0	14.7	9.8
MANY GLACIER PILLOW			4900	5/01	SP	.1	3.4	7.8
MARIAS PASS			5250	4/30	18	7.6	12.0	16.8
MAYNARD CREEK			6210	4/30	46	16.0	13.3	18.0
MAYNARD CREEK PILLOW			6210	4/30	SP	13.2	11.2	14.4
MIDDLE MILL CREEK			7850	4/30	85	26.0	21.0	18.5
MILL CREEK			7500	4/28	34	10.8	6.3	13.1
MINERAL CREEK			4000	5/02	10	3.6	8.4	12.3
MONUMENT PEAK			8850	4/29	76	24.7	25.5	31.2
MONUMENT PEAK PILLOW			8850	5/01	SP	21.0	19.8	29.0
MOULION RESERVOIR			6850	4/25	20	6.5	5.6	3.2
MOUNT ALLEY #7			5700	4/26	87	32.9	40.1	47.7
MOUNT LOCKHART			6400	4/30	48	15.6	17.2	23.3
MOUNT LOCKHART PILLOW			6400	5/01	SP	15.0	17.0	24.3
MUDD LAKE			7650	4/25	48	16.7	19.8	21.1
MULE CREEK			8300	4/29	50	13.0	15.7	11.5
MULE CREEK PILLOW			8350	5/01	SP	13.8	15.5	17.6
NEVADA CREEK			6480	4/29	38	11.2	8.8	12.0
NEVADA CREEK PILLOW			6480	5/01	SP	8.5	12.3	13.8
NEWTON MOUNTAIN			5600	4/25	62	24.4	41.3	38.9
NEZ PERCE CAMP			5650	4/28	31	12.4	10.0	12.7
NEZ PERCE CAMP PILLOW			5650	5/01	SP	12.7	11.5	10.2
NEZ PERCE CREEK			6500	5/04	14	4.9	4.0	4.5
NEZ PERCE PASS			6570	4/28	44	17.8	12.0	15.9
NOISY BASIN			6040	4/24	126	56.7	53.4	52.4
NOISY BASIN PILLOW			6040	5/01	SP	52.3	50.4	44.8
NORTH FK. ELK CREEK			6250	5/02	31	11.8	7.6	10.5
NORTH FK. ELK CREEK PILLOW			6250	5/01	SP	10.2	6.8	10.0
NORTH FORK JOCKO			6330	4/29	89	39.4	34.8	48.3
NORTH MEADOW			7500	5/01	55	14.7	11.5	10.7
NORTHEAST ENTRANCE			7350	5/02	13	4.1	0.0	7.3
NORTHEAST ENTRANCE PILLOW			7350	5/01	SP	5.5	5.3	5.3
NOTCH			8500	4/28	88	28.0	25.8	19.6
OPHIR PARK			7150	4/30	52	19.6	16.7	18.1
PALISADE CREEK			8250	4/25	82	28.8	31.2	33.1
PETERSON MEADOWS			7200	5/02	46	15.0	9.8	11.7
PETERSON MEADOWS PILLOW			7200	5/02	SP	15.0	10.8	12.2
PICKET PIV 0			9450	4/28	75	27.5A	25.0	30.6
PICKFOOT CREEK			6650	4/25	17	5.3	6.5	8.0
PICKFOOT CREEK PILLOW			6650	5/01	SP	6.8	8.6	10.0
PIEGAN PASS #6			5500	4/26	70	26.2	36.9	41.0
PIKE CREEK PILLOW			5930	5/01	SP	17.6	17.8	27.5
PIPESTONE PASS			7200	5/04	20	7.0	6.0	5.8
PLACER BASIN F			8830	4/28	69	21.5A	19.5	24.0
PLACER BASIN PILLOW			8830	5/01	SP	18.7	17.6	20.4
POORMAN CREEK			5100	4/25	52	21.5	30.4	32.5
POORMAN CREEK PILLOW			5100	5/01	SP	19.2	25.6	31.1
PORCUPINE			6500	5/01	28	8.4	3.8	7.9
PORCUPINE PILLOW			6500	5/01	SP	5.4	2.1	2.7
POTOMAGETON PARK			7150	4/27	36	11.6	13.4	11.4
PIARMIGAY			5800	4/25	56	21.9	27.9	40.0
RED MOUNTAIN			6000	4/30	31	10.9	20.5	19.4
RED TOP			5260	4/25	47	18.2	35.3	31.9
ROCK CREEK			5600	4/25	32	11.3	4.6	8.6
ROCK CREEK MEADOWS			8160	4/27	67	21.3	21.5	25.4
ROCKER PEAK			8000	4/27	55	15.4	12.7	17.7

Columbia River Drainage

STREAMFLOW FORECASTS

RIVER NAME AND FORECAST POINT	THIS YEAR		PAST YEAR		THIS YEAR		PAST YEAR		THIS YEAR		PAST YEAR	
	FORECAST		FORECAST		FORECAST		FORECAST		FORECAST		FORECAST	
	THOUSANDS OF CFS	PERCENT	THOUSANDS OF CFS	PERCENT	THOUSANDS OF CFS	PERCENT	THOUSANDS OF CFS	PERCENT	THOUSANDS OF CFS	PERCENT	THOUSANDS OF CFS	PERCENT
PERIOD	May - September				May - July				May - June			
KOOTENAI RIVER below Libby Dam (1)	5,050	77	5,822	6,590	4,240	76	4,812	5,569				
FISHER RIVER near Libby	84.5	44	194	75.0	42	178						
YAK RIVER near Troy	208	50	418	180	46	395						
KOOTENAI RIVER at Leona (1)	5,840	75	7,116	7,838	5,010	74	6,025	6,734	3,965	75	4,325	5,288
INLOW HOULTON RESERVOIR near BUTTE (Million Gallons)					200	90	182	223	178	90	148	197
WARM SPRINGS CREEK AT HEYERS DAM near Anaconda (2)	45.0	102	44.2	36.5	103	35.3						
FLINT CREEK near Southern Cross (3)	15.0	93	17.1	16.1	12.5	94	13.4	13.3				
FLINT CREEK below Boulder Creek (4)	64.0	94		68.3	48.4	93		52.0				
INLOW LOWER WILLOW CREEK RESERVOIR near Hall (5)	10.4	79	9.9	13.2	9.5	77	8.5	12.4				
MIDDLE FORK ROCK CREEK near Philipsburg	63.6	86		74.0	56.5	85		66.3				
NEVADA CREEK near Flinn	13.7	72		19.0	12.0	70		17.2				
BLACKFOOT RIVER near Bonner	600	68		881	525	67		786	445	67		664
CLARK FORK RIVER above Missoula (6)	650	92		709	555	92		601	450	92		490
CLARK FORK RIVER above Missoula	1,250	79	1,227	1,590	1,080	78	998	1,387	895	78	745	1,154
WEST FORK BITTERROOT RIVER near Conner (7)	128	80		160	115	79		146				
BITTERROOT RIVER near Darby	400	76		524	355	75		476	305	75		408
SKALWAGO CREEK near Hamilton	46.5	88		53.0	40.0	87		45.8				
NORTH FORK CREEK near Stevensville (8)	30.0	85		35.3	25.0	83		30.2				
BITTERROOT RIVER at Missoula (9)	1,020	75		1,358	915	74		1,238	775	74		1,046
CLARK FORK RIVER below Missoula	2,270	77		2,948	1,995	76		2,625	1,670	76		2,200
CLARK FORK RIVER at St. Regis	3,065	79	3,077	3,880	2,720	79	2,700	3,451	2,290	79	2,064	2,896
NORTH FORK FLATHEAD RIVER near Columbia Falls	1,240	71		1,742	1,100	70		1,562	915	70		1,301
MIDDLE FORK FLATHEAD RIVER near West Glacier	1,220	72		1,702	1,100	71	1,239	1,546	920	71	960	1,287
SOUTH FORK FLATHEAD RIVER near Columbia Falls (10)	1,550	76		1,646	2,029	75	1,513	1,893	1,220	75	1,215	1,636
FLATHEAD RIVER at Columbia Falls (10)	4,150	74		4,406	5,604	73	3,970	5,117	3,170	73	3,117	4,317
SWAN RIVER near Big Fork	510	85		599	435	85		514				
FLATHEAD RIVER near Polson (11)	5,030	77		5,485	6,522	76	4,892	5,956	3,780	76	3,775	5,002
CLARK FORK RIVER near Plummer (11)	7,950	73		8,834	10,821	73	7,701	9,739	5,930	73	5,855	8,127
JOHNSON RIVER near Thompson Falls	141	65		217	120	63		189				
PROSPECT CREEK at Thompson Falls	74.5	66		113	67.0	64		104				
CLARK FORK RIVER at Whitehorse Rapids (12)	8,760	73		11,935	7,830	73	10,711	6,520	73			8,930

- (1) Adjusted for storage in Lake Kootenai.
- (2) Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.
- (3) Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.
- (4) Sum of Flint Creek at Mayville and Boulder Creek at Mayville.
- (5) Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
- (6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.
- (7) Adjusted for storage in Painted Rocks Reservoir.
- (8) Adjusted for diversion into Sunset Highway Canal.
- (9) Difference in observed flow Clark Fork above and below Missoula.
- (10) Adjusted for storage in Hungry Horse Reservoir.
- (11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.
- (12) Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Mosco Rapids Reservoir.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

WATER SUPPLY OUTLOOK

STREAM OR AREA	Flow Period	
	Spring Season	July Season
Tobacco	Fair	Poor
Little Bitterroot	Poor	Poor
Mission Valley	Fair	Fair
Flint Creek	Avg	Fair
Upper Clark Fork	Avg	Avg
Nevada Creek	Fair	Fair
Blackfoot	Fair	Poor
West-side Bitterroot	Fair	Fair
East-side Bitterroot	Fair	Fair
Bitterroot River	Fair	Fair
Lower Clark Fork	Fair	Poor

Snowpack improves in Upper Clark Fork

Snowpack in the Upper Clark Fork improved considerably during April. Some improvement was also recorded in the Blackfoot and Bitterroot River drainages, however, little change was noted in the Flathead and Kootenai drainages.

All areas still show below to well below average levels of water stored in the snowpack except for the Upper Clark Fork which has some areas with near or a little above average snowpack.

Low elevations showed some melt during April with some snow courses having no snow. In the Kootenai and Flathead River headwaters, the water content measured at the snow courses is not the lowest of record but is generally the second to fifth lowest of record.

SUMMARY OF SNOW MEASUREMENTS

RIVER BASIN AND SUBWATERSHED	Number of Snow Courses	THIS YEAR'S SNOW WATER AS PERCENT OF	
		1961-80 Average	1961-80 Average
East Kootenai/BC	25	87	68
Kootenai/Montana	31	58	57
Bonniers Ferry	56	67	62
Little Bitterroot	9	53	37
N. Fk. Flathead	10	69	67
M. Fk. Flathead	11	87	65
S. Fk. Flathead	13	101	91
Swan	11	103	90
Flathead	54	91	79
Stillwater & Whitefish	9	68	65
Clark Fork above Blackfoot	39	118	100
Blackfoot	23	110	75
Upper Clark Fork above Missoula	62	116	91
Bitterroot	21	112	88
Lower Clark Fork below Missoula	17	84	68
Clark Fork (Total w/o Flathead)	100	105	83
Pend O'Reille (Clark Fork & Flathead)	154	98	81
Columbia (Pend O'Reille & Kootenai)	210	90	76

Columbia runoff expected to be low

Runoff is expected to be below to well below average in all drainages except in the Upper Clark Fork drainage where near average runoff is forecast. Spring and summer streamflows are generally predicted to be in the 70 to 80 percent of average range.

Shortages of irrigation water supplies are expected on most streams soon after the main runoff period. Irrigators not having stored water should be prepared for less than normal water supplies through most of the irrigation season.

The Clark Fork River and Flathead River tributaries are expected to reach their peak snowmelt runoff in late May at lower than normal levels. The Blackfoot River could reach its peak a little earlier.

The Bitterroot River is also expected to have a peak flow a little below average near the end of May or in early June. All of these estimates are based on current conditions and snowpack on snow pillows and could vary depending on precipitation and temperatures during May and early June.

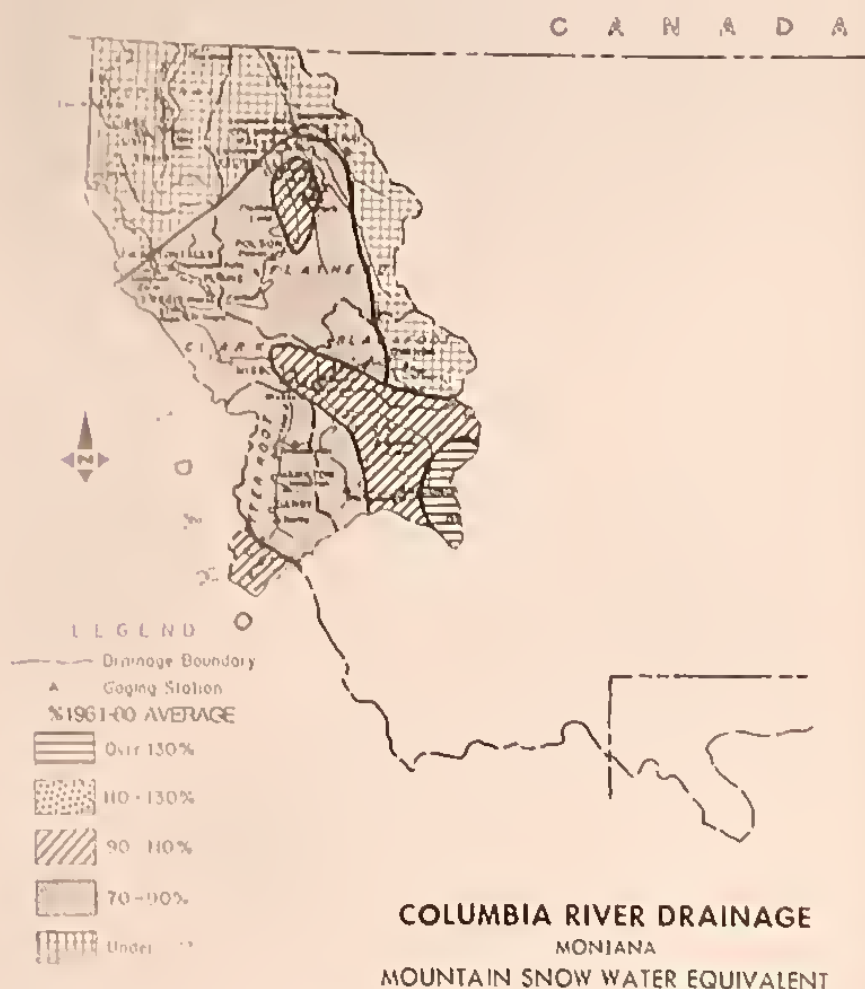
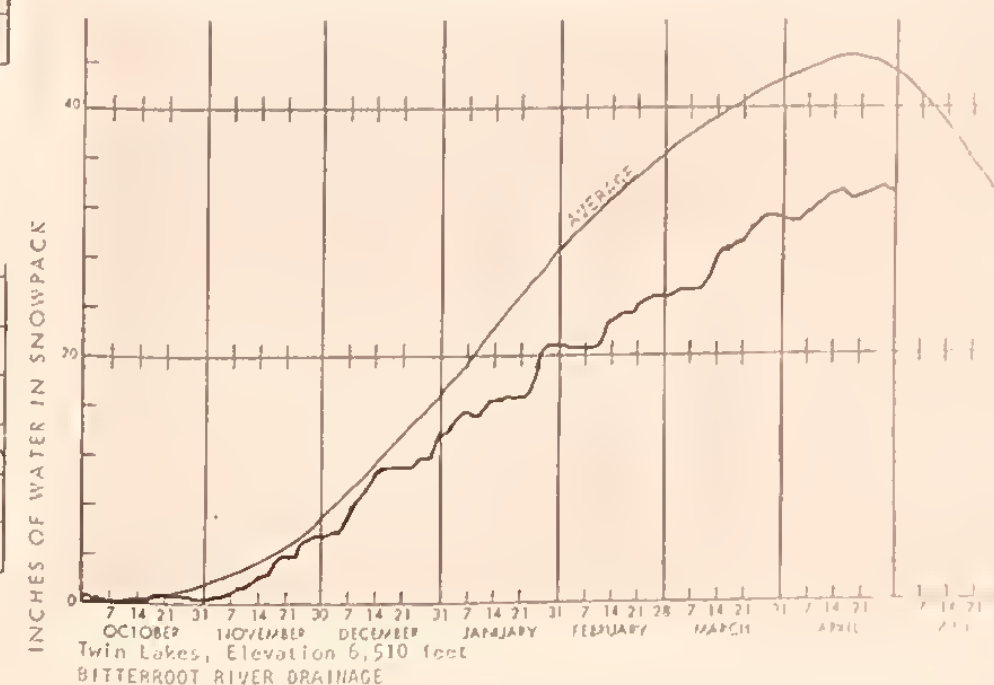
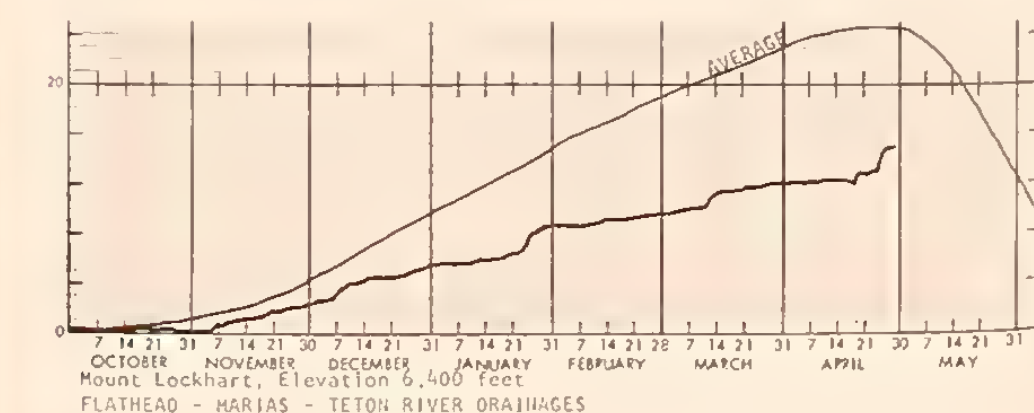
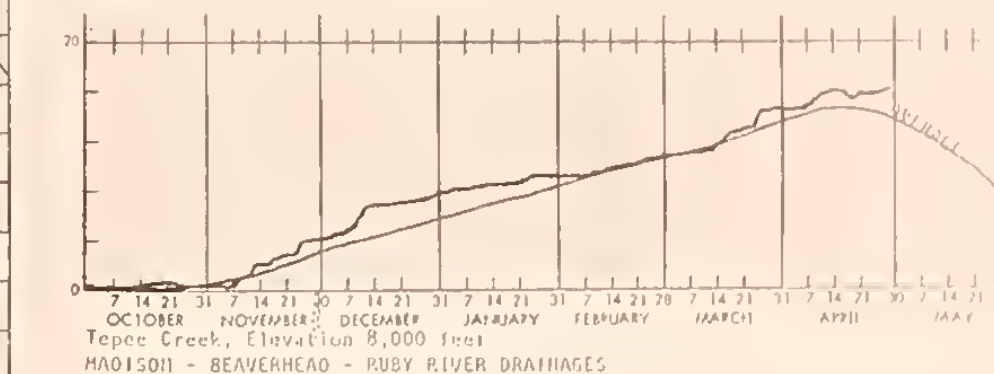
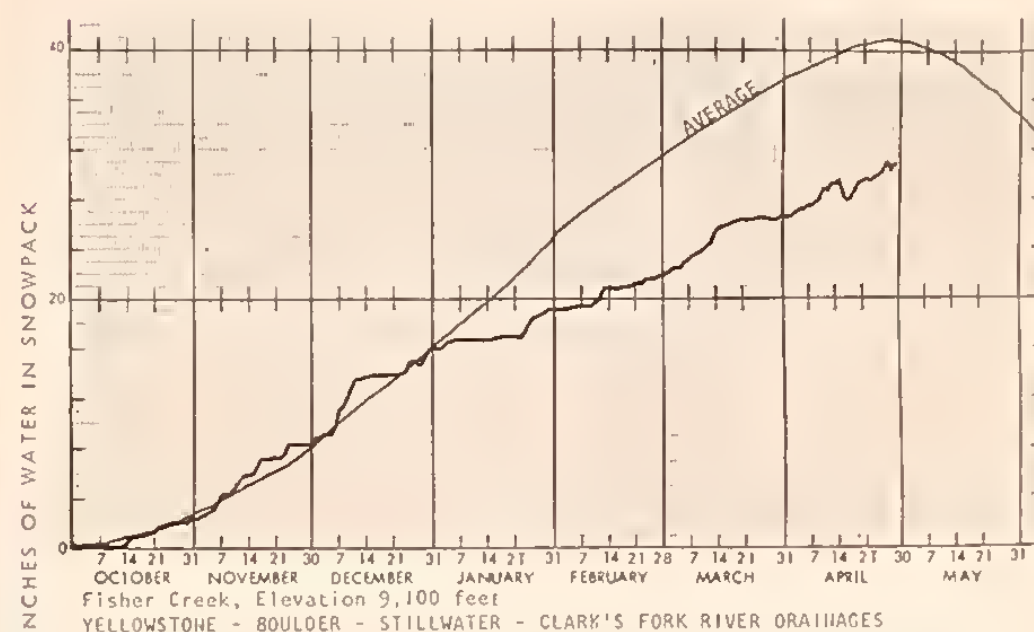
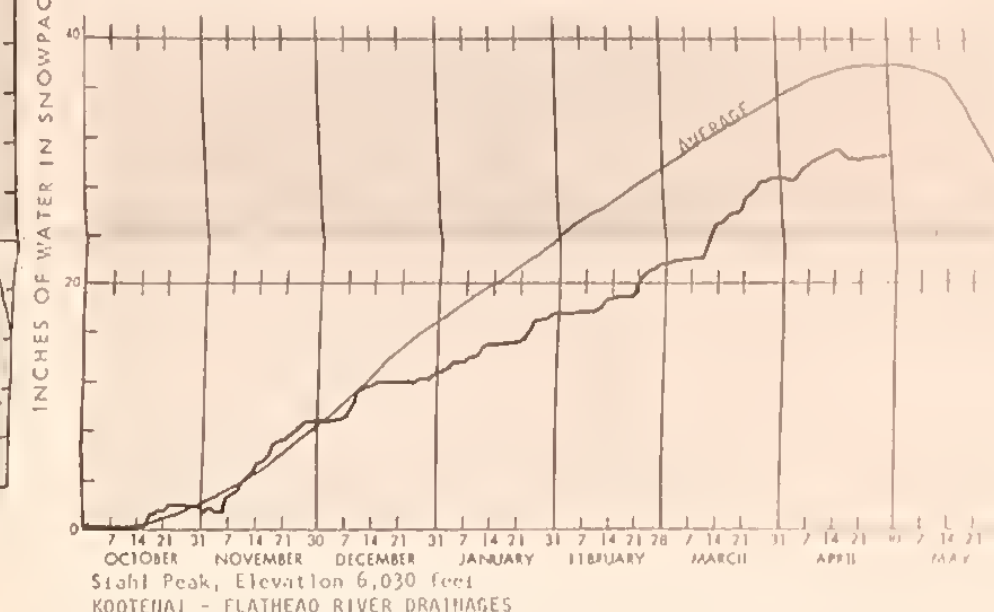
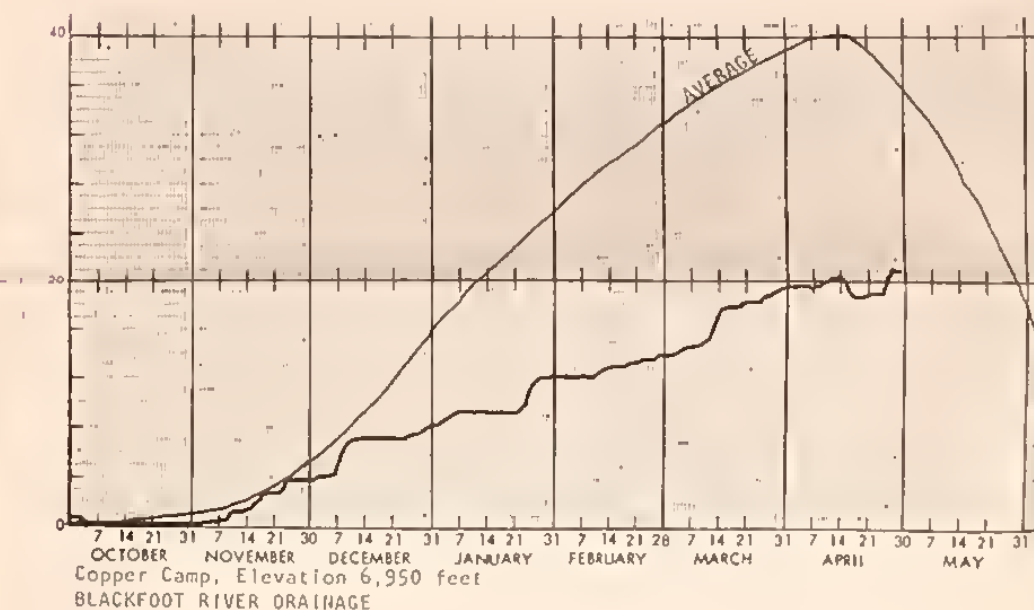
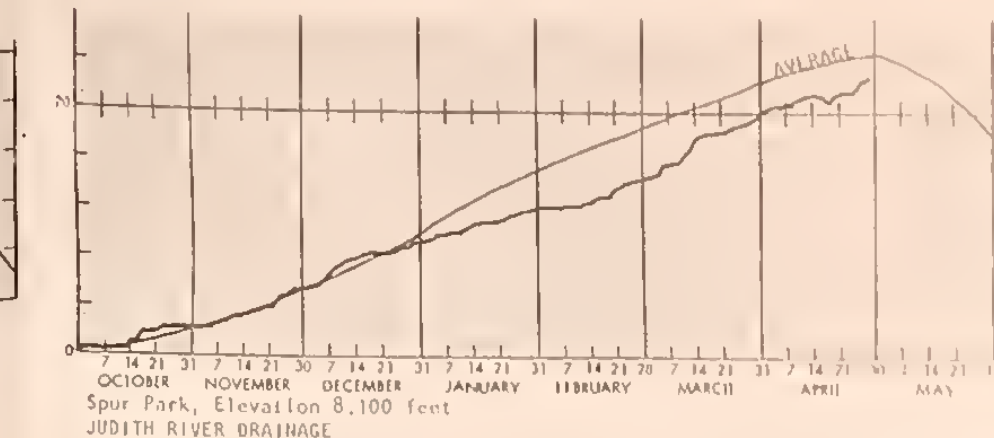
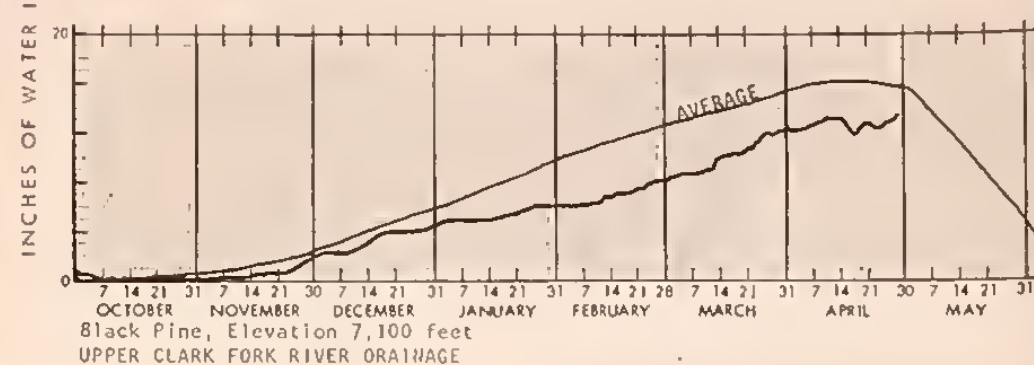
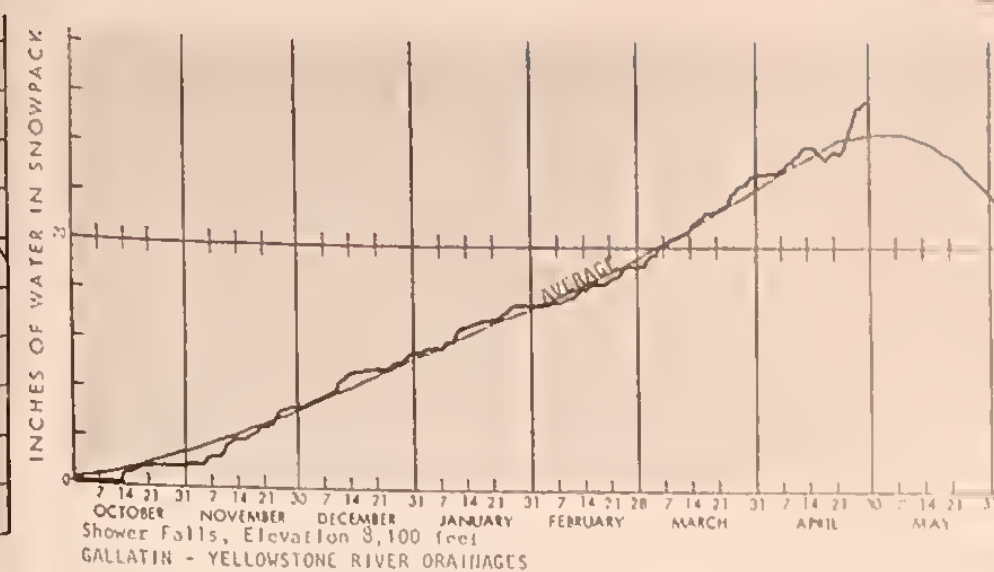
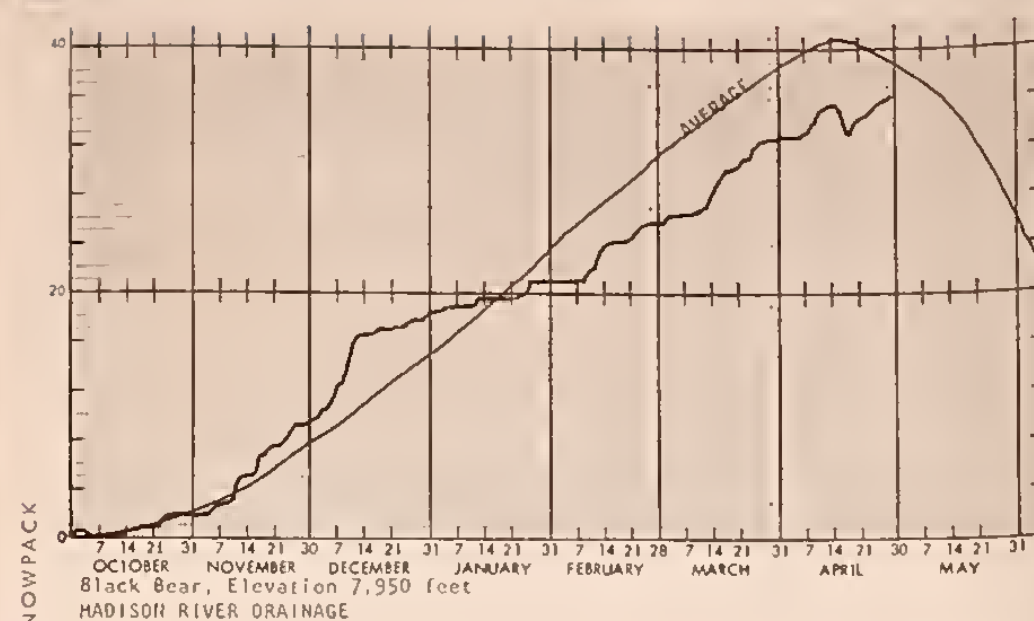
PEAK FLOWS

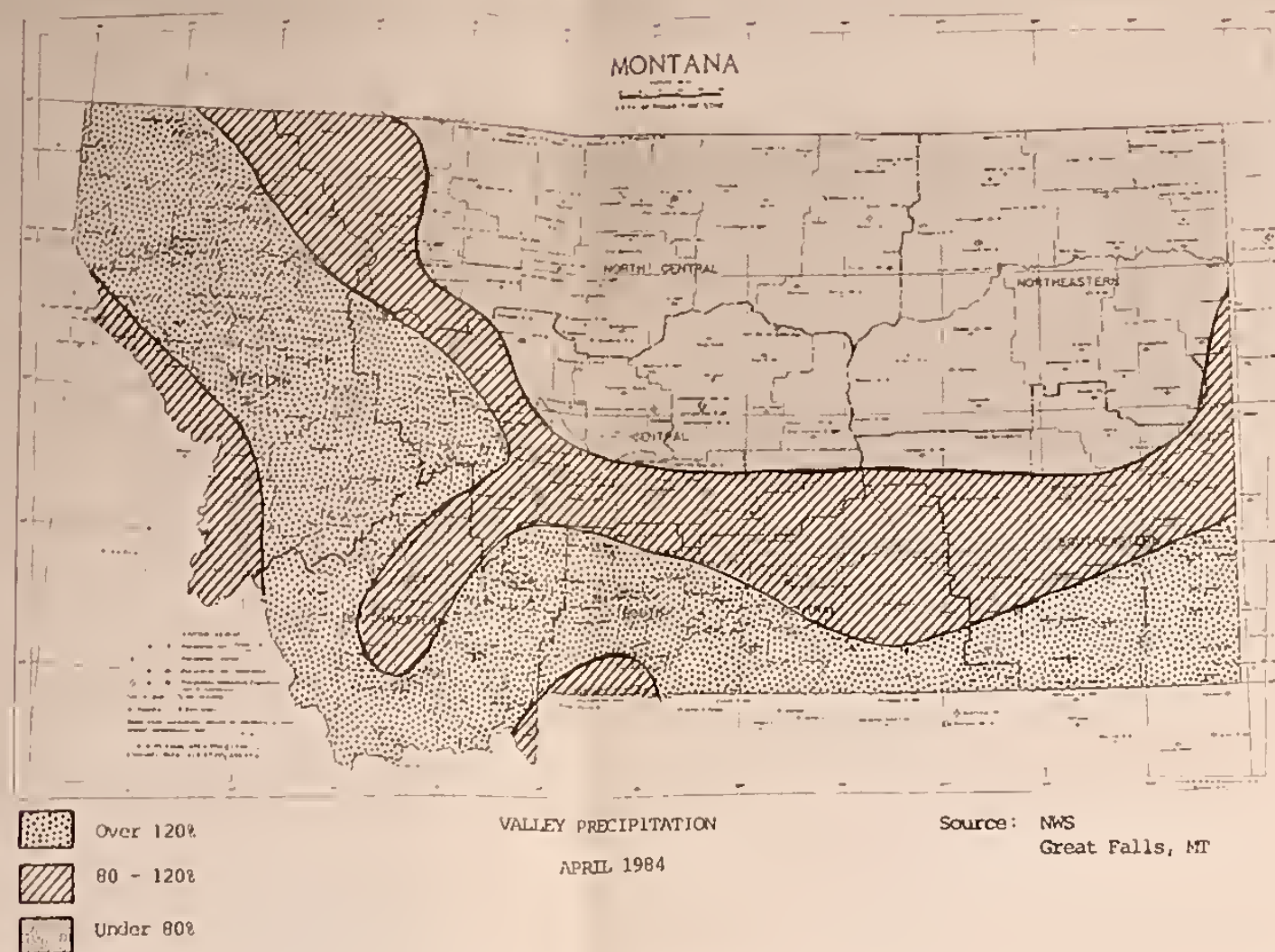
FORECAST POINT	PEAK FLOW (SECOND FEET)	
	Forecast Range	Average
Blackfoot River near Bonner	5,000 - 7,000	10,332
Clark Fork River above Missoula	10,000 - 14,000	16,804
Bitterroot River near Darby	4,000 - 6,000	6,312
Clark Fork River below Missoula	22,000 - 28,000	32,016
Clark Fork River at St. Regis	26,000 - 34,000	40,305
N. Fk. Flathead near Columbia Falls	13,000 - 15,000	22,086
N. Fk. Flathead near West Glacier	12,000 - 14,000	23,534

Heavily saturated water during the snowmelt period may cause the peak to be built up the indicated range.

Average based on 1961-80 period.

SNOW PILLOW DATA





AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES

- Canada**
- Department of the Environment
 - Atmospheric Environment Service
 - Water Management Service
 - British Columbia Ministry of Environment
 - Inventory and Engineering Branch, Hydrology Section
 - Alberta Environment
 - Technical Services Division
- Federal**
- Department of the Army - Corps of Engineers
 - Department of Agriculture - Forest Service
 - Department of Commerce - National Environmental Satellite Service
 - Department of Commerce - National Weather Service
 - Department of Interior - Bureau of Indian Affairs
 - Department of Interior - Fish and Wildlife Service
 - Department of Interior - Geological Survey
 - Department of Interior - National Park Service
 - Department of Interior - Bureau of Reclamation
 - Department of Energy - Bonneville Power Administration

STATE AGENCIES

- Montana Conservation Districts
- Montana Department of Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana State University - Agricultural Experiment Station
- University of Montana - School of Forestry

PRIVATE ORGANIZATIONS

- The Anaconda Company
- Big Sky of Montana
- Butte Water Company
- Flathead Valley Community College
- Montana Power Company
- Pondera County Canal & Reservoir Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH April 30, 1984

Division or Stream	Reservoir	Water Capacity	This Year	Last Year	Average
COLUMBIA					
Kootenai	Kootenai	5,748.2	2,658.0	2,220.0	1,864.0
Flathead	Hungry Horse	3,451.0	2,221.0	2,507.0	1,982.0
	Flathead Lake	1,791.0	789.2	950.8	932.7
	Camas (4)	45.2	32.4	36.4	27.9
	Mission Valley (8)	100.3	67.4	54.2	49.3
Clark Fork	Georgetown Lake	31.0	27.8	25.2	23.7
	Lower Willow Creek	4.9	5.1	3.3	2.7
	Nevada Creek	12.6	11.1	9.9	10.2
	Noxon Rapids	334.6	314.9	312.8	250.1
Bitterroot	Painted Rocks	31.7	---	---	22.0
	Como	34.9	24.4	---	18.1
MISSOURI					
Beaverhead	Lima	84.0	71.5	55.2	54.7
	Clark Canyon	257.2	196.7	184.4	157.5
Ruby	Ruby	38.8	40.0	36.3	35.2
Madison	Hebgen Lake	377.5	266.2	222.3	229.7
	Ennis Lake	41.0	15.7	37.1	36.3
	Middle Creek	8.0	4.2	4.3	4.4
Gallatin	Canyon Ferry	2,043.0	1,584.0	1,568.0	1,499.0
Missouri	Hausser & Helena	61.9	63.0	62.5	59.3
	Helena Valley	10.4	8.3	---	7.6
	Lake Helena	10.4	10.9	10.7	9.8
	Holter Lake	81.9	80.5	80.5	70.8
	Fort Peck Lake	18,910.0	16,140.0	15,790.0	15,250.0
Smith	Smith River	10.6	11.6	10.5	9.1
	Newlan Creek	12.4	9.7	9.0	9.1
Nusselshell	Bair	7.0	4.4	6.8	6.2
	Martinsdale	23.1	17.5	18.8	12.1
	Deadman's Basin	72.2	69.1	68.3	54.3
	Gibson	99.1	60.6	66.2	50.6
	Willow Creek	32.2	27.8	24.8	23.7
	Pishkun	32.0	29.8	30.3	26.4
Marias	Lower Two Medicine	11.9	---	---	10.0
	Four Horns	19.2	---	---	12.9
	Swift	30.0	18.9	19.2	18.3
	Lake Frances	111.9	47.9	85.6	76.9
Milk	Elwell (Tiber)	1,347.0	699.7	714.9	569.5
	Beaver Creek	3.5	3.2	3.1	2.6
	Fresno	127.2	57.4	57.4	103.3
	Nelson	66.8	43.0	44.8	43.9
HUDSON BAY					
St. Mary's	Lake Sherburne	64.3	6.9	8.8	21.6
YELLOWSTONE					
Stillwater	Mystic Lake	21.0	0.0	0.0	2.4
Clark's Fork	Cooney	27.4	19.9	22.4	18.5
Tongue	Tongue River	68.0	24.4	17.3	40.0
Bighorn	Bighorn Lake	1,356.0	849.2	874.0	633.1



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United States
Department of
Agriculture

Soil
Conservation
Service

Montana
Agricultural
Experiment
Station

Bozeman,
Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow
Forecasts as of
May 15, 1984

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
Federal Bldg., Rm. 443
10 East Babcock
Bozeman, MT 59714

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Snowmelt increases with warmer temperatures!

Snow surveys and SMITH reports indicate the water content in most snowpacks continued to increase almost to mid-May. Melt would occur for a few days and then additional snowfall would increase the snowpacks. Low elevation snow in southwest Montana and near Red Lodge, left from the large storm near the end of April, persisted for the first week or two in May.

Near mid-month, warm temperatures throughout the higher elevations of southern Montana caused large snowmelt rates. In southwestern Montana, rainfall accompanied this large snowmelt and produced considerable runoff. Preliminary reports indicate the Ruby River produced peak flows nearly twice as large as any previously measured above Ruby Reservoir.

Most areas in the state received good moisture for the first half of May. The northern part of the state continued to have near to above average snowpacks while those remaining in the northern part are below average.

Based on present snowpack, the peak snowmelt runoff is expected to come in late May to mid-June on most major streams.

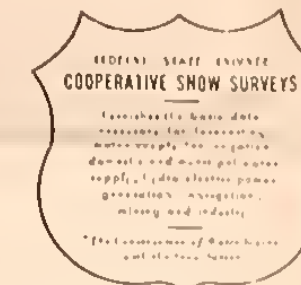
In the Missouri River drainage, the Big Hole River is expected to reach its snowmelt peak runoff in early June. The Madison River inflow to Hebgen Lake is expected to peak near the end of May or in early June. The Gallatin River in still forecast to have peak snowmelt runoff around mid-June. Inflow to Canyon Ferry Reservoir should peak the first or second week in June. Even though the Ruby River has had a major peak of record, it is expected that another secondary snowmelt peak will occur in early June.

Peak snowmelt runoff in the Yellowstone River drainage should occur around mid-June on most streams.

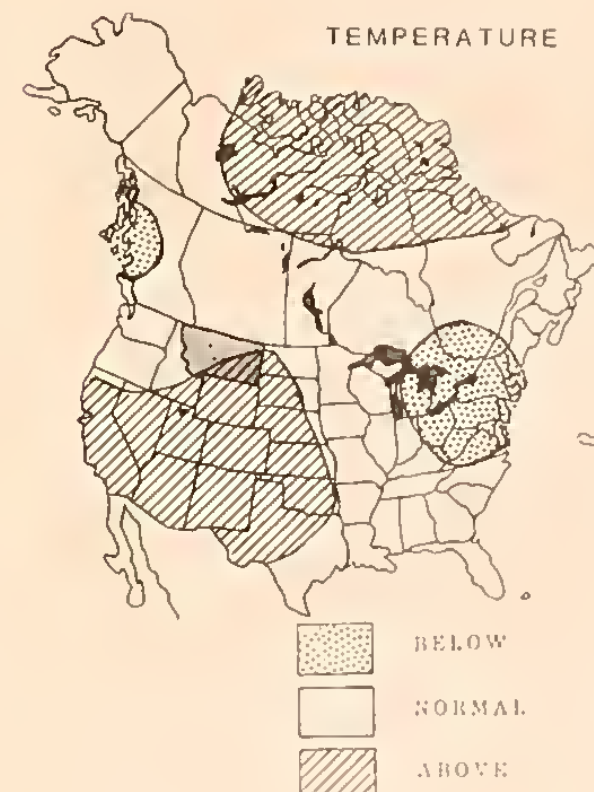
West of the Divide, most streams in the Clark Fork and Flathead drainages are expected to reach their snowmelt peaks in late May. The Bitterroot River could peak in late May or early June.

The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, Room 443, Federal Building, 10 East Babcock, Bozeman, Montana.



TEMPERATURE



average monthly weather outlook

PRECIPITATION



FOR MID-MAY TO MID-JUNE 1984

AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES

- Canada**
- Department of the Environment
 - Atmospheric Environment Service
 - Water Management Service
 - British Columbia Ministry of Environment
 - Inventory and Engineering Branch, Hydrology Section
 - Alberta Environment
 - Technical Services Division
- Federal**
- Department of the Army - Corps of Engineers
 - Department of Agriculture - Forest Service
 - Department of Commerce - National Environmental Satellite Service
 - Department of Commerce - National Weather Service
 - Department of Interior - Bureau of Indian Affairs
 - Department of Interior - Fish and Wildlife Service
 - Department of Interior - Geological Survey
 - Department of Interior - National Park Service
 - Department of Interior - Bureau of Reclamation
 - Department of Energy - Bonneville Power Administration

STATE AGENCIES

- Montana Conservation Districts
- Montana Department of Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana State University - Agricultural Experiment Station
- University of Montana - School of Forestry

PRIVATE ORGANIZATIONS

- The Anaconda Company
- Big Sky of Montana
- Butte Water Company
- Flathead Valley Community College
- Montana Power Company
- Pondera County Canal & Reservoir Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

SNOW SURVEY DATA

SNOW		May 15, 1984		THIS YEAR		PAST RECORD	
DRAINAGE BASIN and or SNOW COURSE		Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME						Last Year	Any Year
BADGER PASS	6900	5/17	65	28.4	32.2	43.5	
BADGER PASS PILLOW	6900	5/15	SP	23.4	30.8	35.3	
BANFIELD MOUNTAIN	5600	5/14	17	6.3	20.2	15.1	
BANFIELD MOUNTAIN PILLOW	5600	5/15	SP	7.2	17.9	12.3	
BAREE CREEK	5500	5/14	65	30.2	40.5	39.9	
BAREE MIDWAY	4600	5/14	33	14.5	24.2	22.9	
BAREE TRAIL	3800	5/14	0	.0	.0	0.0	
BARKER LAKES PILLOW	8250	5/15	SP	16.4	19.9	16.2	
BASIN CREEK PILLOW	7180	5/15	SP	11.2	12.6	8.4	
BEAGLE SPRINGS PILLOW	8850	5/15	SP	10.8	9.5	7.4	
BEAVER LAKE	5900	5/17	30	11.9		23.0	
BLACK BEAR PILLOW	7950	5/15	SP	36.0	39.4	35.3	
BLACK PINE PILLOW	7100	5/15	SP	9.4	10.4	11.5	
BLOODY DICK PILLOW	7550	5/15	SP	8.2		6.0	
BLUE LAKE	5900	5/17	26	12.0	18.7	21.6	
BOTS SOTS	7750	5/14	36	14.7	11.8	7.6	
BOULDER MOUNTAIN PILLOW	7950	5/15	SP	23.4	23.9	19.9	
BOX CANYON PILLOW	6700	5/15	SP	.0	1.9	2.1	
BRIDGER BOWL	7250	5/15	68	30.0	29.6	29.5	
BRIDGER BOWL PILLOW	7250	5/15	SP	29.5	28.3	27.2	
CALVERT CREEK PILLOW	6430	5/15	SP	.0	.0	0.1	
CAMP SENIA	7890	5/14	45	17.6	11.6	9.7	
CARROT BASIN PILLOW	9000	5/15	SP	27.8	28.9	32.9	
CASHE CREEK PILLOW	7800	5/15	SP	9.1	10.2	7.5	
CLOVER MEADOW PILLOW	8800	5/15	SP	23.7	15.0	17.6	
COLE CREEK	7850	5/15	68	26.7	28.0	24.4	
COLE CREEK PILLOW	7850	5/15	SP	26.1	26.8	19.0	
COMBINATION PILLOW	5600	5/15	SP	.0	.1	0.7	
COPPER BOTTOM PILLOW	5200	5/15	SP	.0	1.3	1.7	
COPPER CAMP PILLOW	6950	5/15	SP	19.7	24.7	30.0	
COPPER MOUNTAIN	7700	5/14	27	8.9	11.8	9.0	
CRYSTAL LAKE PILLOW	6050	5/15	SP	12.4	6.7	7.9	
DALY CREEK PILLOW	5780	5/15	SP	.0	1.6	3.7	
DARKHORSE LAKE PILLOW	8700	5/15	SP	28.3	23.6	30.7	
DEADMAN CREEK PILLOW	6450	5/15	SP	.5	.6	3.2	
DISCOVERY BASIN	7050	5/14	31	11.2	10.0	7.5	
DIVIDE PILLOW	7800	5/15	SP	13.0	11.7	8.1	
DUPUYER CREEK PILLOW	5750	5/15	SP	.6	-	-	
EAST BOULDER S	9250	5/15	90	30.0	31.0	33.5	
EMERY CREEK PILLOW	4350	5/15	SP	.7	6.2	1.4	
FISHER CREEK PILLOW	9100	5/15	SP	30.7	34.1	39.6	
FLATTOP MOUNTAIN PILLOW	6300	5/15	SP	34.6	42.1	49.6	
FOURTH OF JULY	3450	5/16	0	.0	.0	0.0	
FRIDAY HILL	4620	5/16	0	.0	8.6	4.1	
FROHNER MEADOWS PILLOW	6480	5/15	SP	6.0	8.0	5.4	
GARVER CREEK	4250	5/14	0	.0	.0	0.3	
GARVER CREEK PILLOW	4250	5/15	SP	.0	.6	2.7	
GIBBONS PASS	7100	5/16	49	22.0	22.6	19.9	
GRAVE CREEK	4300	5/14	0	.0	9.4	7.8	
GRAVE CREEK PILLOW	4300	5/15	SP	.0	7.4	2.1	
GUNSIGHT LAKE	6300	5/17	68	30.6	33.6	41.1	

SNOW		May 15, 1984		THIS YEAR		PAST RECORD	
DRAINAGE BASIN and or SNOW COURSE		Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME						Last Year	Any Year
HAND CREEK PILLOW	5030	5/15	SP	3.4	6.3	3.5	
HAWKINS LAKE	6450	5/14	60	22.7	34.5	30.4	
HAWKINS LAKE PILLOW	6450	5/15	SP	21.8	31.9	30.9	
HELL ROARING DIVIDE	5770	5/16	55	23.1	27.4	24.9	
HOODOO BASIN	6050	5/15	92	42.0	44.9	50.1	
HOODOO BASIN PILLOW	6050	5/15	SP	36.5	39.3	41.9	
HOODOO CREEK	5900	5/15	85	38.6	41.6	46.0	
INTERGAARD	6450	5/14	17	5.7	4.8	6.2	
KINGS HILL	7500	5/15	32	12.0	10.6	15.2	
KRAFT CREEK PILLOW	4750	5/15	SP	.0	.5	2.2	
LAKEVIEW RIDGE PILLOW	7400	5/15	SP	5.3	17.0	4.4	
LEMHI RIDGE PILLOW	8100	5/15	SP	11.9	6.1	8.2	
LICK CREEK	6860	5/14	32	12.8	8.7	6.2	
LICK CREEK PILLOW	6860	5/15	SP	8.3	7.2	4.6	
LOWER TWIN PILLOW	7900	5/15	SP	26.7	27.5	22.9	
LUBRECHT FLUME PILLOW	4680	5/15	SP	.0	.0	0.0	
MANY GLACIER PILLOW	4900	5/15	SP	.0	.0	1.8	
MAYNARD CREEK	6210	5/15	32	12.2	14.0	12.4	
MAYNARD CREEK PILLOW	6210	5/15	SP	13.1		12.0	
MONUMENT PEAK PILLOW	8850	5/15	SP	19.6	22.0	30.2	
MOULTON RESERVOIR	6850	5/15	0	.0	4.1	2.1	
MOUNT LOCKHART PILLOW	6400	5/15	SP	13.5	18.7	21.5	
MULE CREEK PILLOW	8350	5/15	SP	15.1	17.2	17.0	
NEVADA CREEK PILLOW	6480	5/15	SP	5.7	15.6	10.2	
NEWTON MOUNTAIN	5600	5/16	62	25.0	37.8	26.9	
NEZ PERCE CAMP PILLOW	5650	5/15	SP	8.1	6.5	5.1	
NOISY BASIN PILLOW	6040	5/15	SP	55.6	50.1	40.4	
NORTH FK. ELK CREEK PILLOW	6250	5/15	SP	4.6	6.4	4.8	
NORTHEAST ENTRANCE PILLOW	7350	5/15	SP	.8	3.7	1.5	
PICKET PIN D	9450	5/15	93	30.5A	30.0	30.3	
PICKFOOT CREEK PILLOW	6650	5/15	SP	.0	2.6	4.7	
PIKE CREEK PILLOW	5930	5/15	SP	14.8		20.9	
PLACER BASIN F	8830	5/15	78	24.0A	23.5	23.9	
PLACER BASIN PILLOW	8830	5/15	SP	21.2	21.6	21.5	
POORMAN CREEK	5100	5/14	44	18.6	25.7	22.6	
POORMAN CREEK PILLOW	5100	5/15	SP	17.3	20.3	23.3	
PORCUPINE PILLOW	6500	5/15	SP	1.6	1.9	0.4	
RED MOUNTAIN	6000	5/15	30	10.6	15.9	15.0	
RED TOP	5260	5/16	41	16.2	31.0	19.3	
ROCKER PEAK PILLOW	8000	5/15	SP	12.7	18.4	18.6	
SADDLE MOUNTAIN PILLOW	7900	5/15	SP	20.2	22.9	26.8	
SHOWER FALLS PILLOW	8100	5/15	SP	34.7	29.1	29.0	
SILVER RUN	6630	5/14	16	5.3	.0	2.2	
SILVER RUN PILLOW	6630	5/15	SP	.4	.0	0.0	
SKALKAKO SUMMIT PILLOW	7250	5/15	SP	19.8	23.3	25.8	
SKYLARK TRAIL PILLOW	6200	5/15	SP	25.9	25.1	29.7	
SOUTH FORK SHIELDS PILLOW	8100	5/15	SP	25.1		19.1	
SPOTTED BEAR MOUNTAIN	7000	5/17	0	0.0A	4.0	6.4	
SPUR PARK PILLOW	8100	5/15	SP	21.8	21.3	25.0	
STAHL PEAK	6030	5/14	83	36.0	46.9	40.6	
STAHL PEAK PILLOW	6030	5/15	SP	33.1	40.2	37.2	
STAR LAKE E	9650	5/14	99	39.5A	45.5	52.0	
TEPEE CREEK PILLOW	8000	5/15	SP	14.8	15.9	11.5	
TIMBERLINE CREEK	8850	5/14	67	22.2	23.2	18.7	
TRINKUS LAKE	6100	5/17	85	39.8	38.6	40.0	
TWELVEMILE CREEK PILLOW	5600	5/15	SP	3.4	.0	6.4	
TWIN CREEKS	3580	5/17	0	0.0A	0.0	0.2	
TWIN LAKES PILLOW	6400	5/15	SP	34.3	32.2	38.7	
WALDRON PILLOW	5600	5/15	SP	.0	4.2	3.2	

SNOW		May 15, 1984		THIS YEAR			PAST RECORD	
DRAINAGE BASIN & SNOW COURSE				Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Elevation	Last Year	Any Year					
WARM SPRINGS PILLOW	7800	5/15	SP	24.8	24.9	27.5		
WEASEL DIVIDE	5450	5/14	S2	21.2	32.8	30.8		
WHISKEY CREEK PILLOW	6800	5/15	SP	10.4	13.6	9.7		
WHITE MILL PILLOW	8700	5/15	SP	23.0	25.1	25.1		
WILLOW CREEK	6500	5/15	14	5.4	.0	2.7		
WOOD CREEK PILLOW	5960	5/15	SP	.0	5.5	7.0		

WYOMING

BALD MOUNTAIN PILLOW (WY)	9380	5/15	SP	21.9	-	-
BEARTOOTH LAKE PILLOW (WY)	9270	5/15	SP	17.9	-	-
BURGESS R.S. PILLOW (WY)	7880	5/15	SP	18.6	-	-
CANYON PILLOW (WY)	7940	5/15	SP	5.8	-	-
PARKERS PEAK PILLOW (WY)	9400	5/15	SP	21.8	-	-
SYLVAN LAKE PILLOW (WY)	8420	5/15	SP	19.4	-	-
TROUT CREEK PILLOW (WY)	8400	5/15	SP	8.5	-	-
WOLVERINE PILLOW (WY)	7650	5/15	SP	3.5	-	-

BRITISH COLUMBIA

FERNIE (BC)	3510	5/14	0	.0	-	0.2
FERNIE EAST (BC)	4100	5/14	0	.0	-	3.0
FERNIE NE (BC)	3510	5/14	0	.0A	-	0.0
FIDELITY MOUNTAIN (BC)	6130	5/14	105	45.5	-	53.1
GLACIER (BC)	4100	5/13	43	19.8	-	21.8
KICKING HORSE (BC)	5410	5/14	22	8.3	-	9.2
MARBLE CANYON (BC)	4990	5/13	17	6.4	-	7.7
MORRISSEY RIDGE (BC)	6100	5/14	45	19.1	-	22.2
MOUNT ABBOT (BC)	6490	5/14	115	49.3	-	55.9
SINCLAIR PASS (BC)	4490	5/15	0	.0	-	-
SULLIVAN MINE (BC)	5080	5/14	3	.3	-	6.2

LATE ARRIVING DATA

Dix Hill	6400	5/16	0	0.0	-	-
North Fork Jocko	6330	5/18	79	37.4	35.5	42.8
Stuart Mountain	7400	5/18	72	32.8	33.6	30.0
TV Mountain	6800	5/18	42	17.9	17.6	17.9
Upper Holland Lake	6200	5/18	62	26.9	25.4	32.7

SP - Snow Pillow observations; water content only
A - Aerial observation; water content estimate.
EST - Estimated water content.



Many streams in Montana are experiencing high flows due to rain and melting snow.